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Lawrence Livermore National Laboratory
University of California
Livermore, California 94551

Environmental Restoration Acronyms and Abbreviations

Compilers:

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June 1996

***Weiss Associates, Emeryville, California**

Environmental Protection Department
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1,1,1-TCA	1,1,1-trichloroethane
1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethylene, also 1,1-dichloroethene
1,2-DCA	1,2-dichloroethane
1,2-DCB	1,2-dichlorobenzene
1,2-DCE	1,2-dichloroethylene, also 1,2-dichloroethene
1,3-DCB	1,3-dichlorobenzene
1,4-DCB	1,4-dichlorobenzene
A	Ampere
AA	Atomic Absorption
AAL	Applied action level
AAQS	Ambient air quality standards
ACE	Army Corps of Engineers
acfm	Actual cubic feet per minute
ACG	Ambient concentration guide
ACGIH	American Conference of Governmental Industrial Hygienists
ACI	(1) Accelerated Cleanup Initiative; or (2) American Concrete Institute
ACL	(1) Ambient concentration limit; or (2) Alternate concentration limit (EPA)
ACO	Administrative consent order
ACPD	Alameda County Planning Department
ADI	Acceptable daily intake
AEA	Atomic Energy Act
AEC	Atomic Energy Commission
afy	Acre-feet per year

AIC	Acceptable intake for chronic exposures (EPA)
AIP	Agreement in principle
AIS	Acceptable intake for subchronic exposures (EPA)
AISC	American Institute of Steel Construction
AL	Action level (for drinking water)
ALARA	As low as reasonably achievable
ALPHAQ	A computer code used to process alpha radiation counts for interpretation. Used by LLNL's Nuclear Chemistry Division in quantitative analysis of samples collected to determine the amount of alpha radiation.
amsl	Above mean sea level
ANN	Artificial neural network (used at LLNL); also ANNA, Artificial neural network analysis
ANSI	American National Standards Institute
AO	Administrative order
AOS	Adult on site
APE	Area of potential effect
API	American Petroleum Institute
AQMD	Air Quality Management District
ARAR	Applicable or relevant and appropriate requirement
ARB	Air Resources Board
ASCS	Agricultural Stabilization and Conservation Service
ASDP	Assistant Secretary for Defense Programs
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AT	Averaging time
ATA	Advanced test accelerator. A particle beam acceleration pilot project, located in the northwest part of Site 300 (Building 865).
ATSDR	Agency for Toxic Substances and Disease Registry
AVI	Active vacuum induced. A type of soil vapor survey (SVS) in which soil vapor samples are pumped through a driven soil probe.
AVI SVS	Active vacuum-induced soil vapor survey
AVOC	Aromatic VOCs; BTEX plus chlorobenzene and the dichlorobenzenes.
AWQC	Ambient water quality criteria

AWS	American Welding Society
AWWA	American Water Works Association
B	Bulk density (soil)
B/P	Bioaccumulative or persistent (toxic substance)
BAAQMD	Bay Area Air Quality Management District. The local agency responsible for regulating stationary air emission sources (including Livermore and Site 300) in the San Francisco Bay area.
BACT	Best available control technology
BAL	Bronchoalveolar lavage (toxicology)
BAT	(1) Best available technology; or (2) Best available treatment
BCA	Brown and Caldwell Analytical Laboratories
BCE	Basic capital equipment
BMP	Best management practice
BOD	Biochemical oxygen demand. In mg/L, the amount of oxygen consumed by a living organism. BOD_5 = 5-day biochemical oxygen demand.
BORE	A numerical code used to analyze ground water flow through fractures. It will determine the inflow parameters and fracture-specific fluid electrical conductivity of hydraulically conductive fractures.
BPHA	Baseline public health assessment
BTEX	Benzene, toluene, ethylbenzene, xylene(s)
BTGA	Best technology generally available
BTX	Benzene, toluene, and xylene(s)
BVL	Borehole video log. The log from a type of borehole camera that is used to record a videotape image of an uncased or cased borehole.
BW	Body weight (toxicology)
C/N	Carbon/nitrogen ratio
ca	Cancer; notation in EPA PRGs.
CA	Correction action
CAA	Clean Air Act
CAC	California Administrative Code
CAD	Computer aided design
CADD	Computer aided design and drafting
CAG	Carcinogen Assessment Group (EPA)
Cal EPA	California Environmental Protection Agency. The California State agency responsible for incidents of hazardous waste contamination that affect public health.

CAL/OSHA California Occupational Safety and Health Administration

CAM WET California Assessment Manual, Waste Extraction Test. A California Department of Toxic Substances Control (DTSC) procedure for evaluating the leachability of certain metals, pesticides, and other organics from a semisolid or solid waste. The test is used to determine the amount of extractable substance in a waste or other material as set forth in the California Code of Regulations Title 22, section 662261.24, pp. 655−657.

CAPCOA California Air Pollution Control Officers Association

CAREs Citizens against a radioactive environment

CAS Chemical Abstract Service. The CAS registry number provides definitive identification of a chemical.

CB Cement-bentonite

CBI Confidential business information

CCC Calibration check compounds

CCl_4 Carbon tetrachloride

CCR California Code of Regulations (formerly known as the California Administrative Code [CAC])

CDF California Department of Forestry

CDFG California Department of Fish and Game

CDI (1) Chronic daily intake (EPA); or (2) Case development inspection (RCRA)

CDP Common depth points. A method used for processing seismic data to improve signal-to-noise ratio (seismology).

CEC Cation exchange capacity

CEI Compliance evaluation inspection

CEQ Council on Environmental Quality

CEQA California Environmental Quality Act of 1970. This legislation regulates the issuance of permits for the construction and operation of any facility in California with potential to harm the environment.

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act of 1980, also known as Superfund. This law authorizes the Federal government to respond directly to releases of hazardous substances that may endanger public health or the environment. The U.S. EPA is responsible for managing Superfund. The major step in the Superfund process is the Remedial Investigation/Feasibility Study. CERCLA was amended in 1986 with the passage of the Superfund Amendments and Reauthorization Act (SARA).

CERCLIS CERCLA information system

CFEST Coupled Fluid Energy and Solute Transport

cfm Cubic feet per minute

CFR Code of Federal Regulations

cfs	Cubic feet per second
CFU/gdw	Colony forming units/gram dry-weight of soil (biology/botany)
CGI	Combustible gas indicator
CGL	Chemistry Group Leader
CGSA	Central General Services Area, LLNL Site 300
CHC	Chlorinated aliphatic hydrocarbon; includes chlorinated methane, ethane, and ethene.
$CHCL_3$	Chloroform
Ci	An abbreviation for Curie, a measure of radioactivity.
CI	Construction Inspector
CIF	Coring-induced fracture
CL	Caliper log. The log from a caliper tool (three-arm or four-arm), a type of geophysical borehole surveying tool.
CLLE	Continuous liquid-liquid extractables
CLP	Contract Laboratory Program (EPA)
CM	Construction Manager
CMB	Claystone marker bed. A Neroly Formation unit at Site 300, clearly evident on geophysical borehole surveys, that is used for stratigraphic correlations throughout the southeastern part of the site.
CME	Comprehensive Ground Water Monitoring Evaluation (RCRA)
CMP	(1) Common mid-points. A method used for processing seismic data to improve signal-to-noise ratio; or (2) Compliance Monitoring Plan
CNDDB	California Natural Diversity Database (botany)
CNPS	California Native Plant Society
CNS	Central nervous system
CO_2	Carbon dioxide
CoC	Chain-of-custody. A form and method for documenting the history and possession of a sample from the time of its collection, through its analysis and data reporting, to its final disposition.
COC	Chemical of concern
COD	Chemical oxygen demand. A rough estimate of biochemical oxygen demand (BOD).
CP	(1) Control point; or (2) Contingency Plan
CPF	Cancer potency factor (toxicology)
CPO	Control Point Operator
CPR	Cardiopulmonary resuscitation
cps	Counts per second (radiology)

CPVC	Chlorinated polyvinyl chloride
CQA	Construction quality assurance
CRP	Community Relations Plan. The CRP outlines specific community relations activities that will occur during the remedial response at a site. The CRP also outlines a method to keep the public informed of work at the site, and defines ways for citizens to review and comment on decisions that may affect the final site actions. A CRP is typically placed in the information repository or repositories established for the site.
Cr (VI)	Hexavalent Chromium
CRWQCB	California Regional Water Quality Control Board
CSI	Construction Specifications Institute
CSM	Conceptual site model; used in EPA programs.
CSVRA	Carnegie State Vehicular Recreation Area
CVAA	Cold vapor atomic absorption
CWA	Clean Water Act
CWG	Community Work Group
CZ	Containment Zone
D&D	Decontamination and decommissioning
D-38	Depleted uranium (informal term)
DA	Data Administrator
DAAA	Direct aspiration atomic absorption
DATAEDIT	A computer code used to manipulate statistical data.
dB	Decibels
DBM	Database manager
DCA	Dichloroethane
DCB	Dichlorobenzene
DCC	Dichlorocarbonyl (phosgene)
DCE	Dichloroethylene. A volatile organic compound (VOC) commonly used as a solvent. Also referred to as dichloroethene.
DCG	Derived Concentration Guide. Concentrations of radionuclides in water and air that could be consumed or inhaled continuously (365 days/yr) and not exceed the Department of Energy (DOE) primary radiation protection standard for the public.
DCO	Document Control Officer
DCP	1,2-Dichloropropane
DDWM	Dissolved Drinking Water Metals
DEIS	Draft Environmental Impact Statement

DG	Drilling geologist
DHS	Department of Health Services. A State of California agency also referred to as DOHC.
DI	Deionized water
diam	Diameter
DL	Designated level
DMG	Data Management Group
DNAPL	Dense nonaqueous-phase liquid, e.g., trichloroethylene (TCE), which is denser than water.
DO	Dissolved oxygen
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy. The federal agency responsible for energy research and nuclear weapons design. The University of California contracts with DOE to operate Lawrence Livermore National Laboratory (LLNL). Most LLNL facilities and equipment are owned by DOE. DOE's Oakland Operations Office (DOE/OAK) administers the LLNL contract, among others.
DOHS	Department of Health Services. A State of California agency also referred to as DHS.
DOL	U.S. Department of Labor
DOT	U.S. Department of Transportation
DP	Defense Programs
dpm/cm^2	Disintegrations per minute per centimeter squared
DRB	Drainage Retention Basin
DSA	Detailed Study Area
DTSC	Department of Toxic Substances Control. A State of California agency.
DUS	Dynamic Underground Stripping
DUSDP	Dynamic Underground Stripping Demonstration Project
DWAL	State drinking water action level
DWR	Department of Water Resources
E	An alternate notation to express exponential numbers. E^n is used to indicate 10^n: for example, 4,300,000 = 4.3 E+6; 0.000013 = 1.3 E-5; 2×10^7 = 2 E+7.
EA	Environmental assessment. A report that identifies potential significant environmental impacts from any Federally approved or funded project that may change the physical environment. If an EA shows the potential for significant impact, an Environmental Impact Report (EIR) or Environmental Impact Statement (EIS) is required.
EBCT	Empty bed contact time (for GAC)
ECAO	Environmental Criteria and Assessment Office (EPA)

ECC	Environmental compliance and cleanup
ECD	Electrolytic conductivity detector. Also abbreviated ELCD.
ED	Exposure duration (toxicology)
ED_{10}	Ten percent effective dose (EPA)
EDB	Ethylene dibromide
EDC	(1) 1,2-Dichloroethane; or (2) Ethylene dichloride
EE	Electronic Engineering
EE/CA	Engineering Evaluation/Cost Analysis
EEG	Electroencephalogram
EEO	Equal Employment Opportunity
EF	Exposure frequency
EFA	East Firing Area
EGSA	Eastern General Services Area, LLNL Site 300
Eh	A measure of the redox potential of an aqueous solution. Positive Eh values indicate an oxidizing solution; negative Eh values indicate a reducing solution. The numerical value is determined by commercially-available instrumentation.
EIR	Environmental Impact Report. A detailed report on the significant environmental impacts from any project that is carried out, approved, or funded by a local or California State agency that may change the physical environment. The EIR process was created by the California Environmental Quality Act (CEQA).
EIS	Environmental Impact Statement. A detailed report on the significant environmental impacts that a pending structure or development will have on the environment. An EIS must be prepared by a government agency when a "major" Federal action is planned that will have a "significant" impact on the environment. The EIS process was created by the National Environmental Policy Act (NEPA).
EM-40	Environmental Management Program
EM-50	Innovative Technologies Program under DOE Environmental Management
EMAD	Environmental Monitoring and Analysis Division. Dissolved Division of LLNL's Environmental Protection Department (EPD).
EMG	Environmental Monitoring Group. Former name of group in LLNL's Environmental Protection Department (EPD).
EMI	Electromagnetic induction
EP TOX	Extraction procedure toxicity test

EPA	U.S. Environmental Protection Agency. The Federal agency responsible for enforcing environmental laws including the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)—known as Superfund—and its amendments, the Resource Conservation and Recovery Act (RCRA), and other legislation. The EPA works with State and local agencies, providing technical oversight for cleanup activities at Federal facilities regulated by the Superfund program.
EPD	Environmental Protection Department. EPD provides LLNL programs with an array of services for managing wastes and protecting the environment. EPD's mission is to maintain adequate protection of the environment by ensuring that LLNL programs understand and meet their environmental responsibilities as stipulated in environmental legislation, regulations, and Department of Energy (DOE) orders. Ultimately, EPD strives to minimize the impact of LLNL operations on the environment.
ERA	(1) Environmental Remedial Action; or (2) Expedited Remedial Action
ERD	Environmental Restoration Division. A division of LLNL's EPD.
ERP	Environmental Restoration Program. A Department of Energy (DOE) program to clean up environmental contamination caused by past practices at DOE facilities.
ERT	Emergency Response Team
ES&H	Environmental safety and health
ESB	Enhanced soil bioremediation
ESD	(1) Explanation of Significant Difference; or (2) Environmental Sciences Division. A former Division at LLNL, now known as Health and Ecological Assessment Division of the Environmental Programs Directorate.
eV	Electron volt
EWG	Elastic wave generator (seismology)
°F	Degrees Farenheit
FC	Field coordinator
FCC	Federal Communication Commission
FEC	Fracture-specific, fluid, electrical conductivity (well logging)
FEV	Forced expiratory volume (toxicology)
FFA	Federal Facility Agreement. A negotiated agreement for a Federal facility operated directly by the government or under contract with another entity, for example, the University of California. With the passage of Superfund Amendments and Reauthorization Act (SARA), Federal facilities became subject to the same requirements to which other responsible parties must adhere, once they are placed on the Superfund National Priorities List (NPL).
FHC	Fuel hydrocarbon
FID	Flame ionization detector

FIDLER	A radiation detection instrument that indicates the presence of depleted uranium or other alpha-emitting radionuclides
FIFRA	Federal Insecticide, Fungacide, and Rodenticide Act
FIT	Federal Investigation Team (EPA)
FLAA	Flame atomic absorption (chemistry)
f_{oc}	Fraction organic carbon content of soil (g/g)
FOIA	Freedom of Information Act
FONSI	Finding of no significant impact. A conclusion that may be reached after preparation of an environmental assessment under the National Environmental Policy Act (NEPA). If this conclusion is accepted, the project may progress without significant oversight by environmental agencies.
FRDS	Federal Reporting Data System (EPA)
Freon 11	Fluorotrichloromethane. Also known as trichlorofluoromethane.
Freon 113	1,1,2-trichlorotrifluoroethane or 1,1,2-trichloro-1,2,2-trifluoroethane. Also known as trichlorotrifluoroethane.
FS	Feasibility study. A study made on the basis of a remedial investigation (RI) to determine the feasibility of correcting the release, or threat of release, of hazardous substances, pollutants, or contaminants. The study evaluates and develops remedial action alternatives to prevent or mitigate the release or migration of hazardous substances or contaminants.
ft	Feet, foot
FTE	Full-time employee
FTL	Facility Task Leader
FUSRAP	Formerly Utilized Sites Remedial Action Plan
FVV	Forced vital volume (toxicology)
FWAL	A geophysical borehole survey, full waveform acoustic log. FWAL records the entire waveform of an acoustic signal.
FWPCA	Federal Water Pollution Control Act
FY	Fiscal year
g	(1) Gram; or (2) Gravity
G&A	General and administrative
G&A/LDRD	General and Administrative/Laboratory Directed Research and Development
g/mL	Grams per milliliter
GAC	Granular activated carbon
gal	Gallon(s)
GC	Gas chromatography
GC/MS	Gas chromatography/mass spectrometry

GFAA	Graphite furnace atomic absorption
gpd	Gallons per day
gpm	Gallons per minute
GPR	Ground-penetrating radar. A surface geophysical method that uses radio-frequency waves to image buried metal objects.
GRA	General Response Action
GSA	General Services Area of LLNL Site 300
GWTS	Ground water treatment system
GZA	Goldberg-Zoino & Associates
^{3}H	Tritium (radiochemical symbol)
H	Henry's Law constant
h	hour(s)
H&SC	Health & Safety Code
H_20	Water
H_20_2	Hydrogen peroxide
HA	Health Advisory
ha	Hectare; area unit of measurement = 100m × 100m.
HAR	Hydrogeologic assessment report; mandated by the Katz bill in California.
HASP	Health and Safety Plan
HAZWRAP	Hazardous Waste Remedial Action Program
HCB	Hexachlorobenzene
HCD	Hazards Control Department at LLNL
HCl	Hydrochloric acid
HCRU	Hexavalent chromium removal unit
HDPE	High-density polyethylene
HE	High explosives or high-explosives compounds such as HMX, RDX, or TNT.
HE-OBTF	High Explosives Open Burn Treatment Facility
HEA	Health Effects Assessment (EPA)
HEAST	Health Effects Assessment Summary Tables
Hg	Mercury
HGL	Hydrogeology Group Leader
HI	Hazard index. The sum of more than one hazard quotient for multiple substances and/or multiple exposure pathways. The HI is calculated separately for chronic, subchronic, and exposures of shorter duration (toxicology).
HIF	Handling-induced fracture

HMX	A high explosive, known also as octogen or homocyclonite. Its chemical name is cyclotetramethylenetetranitramine or octahydro-1, 3, 5, 7-tetranitro-1, 3, 5, 7-tetrazocine ($C_4H_8N_8O_8$). Several meanings have been ascribed to the acronym HMX; the most common is High Melting Point Explosive. HMX was developed during World War II by the United Kingdom. It is a coproduct of the most common synthesis for RDX, and is present in technical grades of RDX.
hp	Horsepower
HPLC	High-performance liquid chromatography. Used in high-explosives and other chemical analyses.
HQ	Hazard quotient
hr	Hour(s)
HRS	Hazard Ranking System (EPA)
HSP	Health and Safety Plan
HSU	Hydrostratigraphic unit
HT	Tritiated hydrogen gas
HTO	Tritiated water (and water vapor)
HVAC	Heating, ventilation, and air conditioning (systems)
HWAP	Hazardous Waste Assessment Project
HWM	Hazardous Waste Management. A division of LLNL's Environmental Protection Department (EPD).
HWMD	Hazardous Waste Management Division
HWS	Hazardous waste site
i.d.	Inside diameter. A measure of pipe size.
IARC	International Agency for Research on Cancer (EPA)
IC	Concentration that causes sublethal or inhibitory effects
ICAP	Inductively coupled argon plasma. An analytical technique used for analyzing metals.
ICBO	International Conference of Building Officials
ICP	Inductively coupled plasma
ICp	Concentration that causes sublethal or inhibitory effects on p% of the test population
ID	Identification
IDL	Instrument detection limit
IDW	Investigation-derived waste
in.	Inch. The trailing period differentiates between "inch" and the preposition "in".

INEL	Idaho National Engineering Laboratory (DOE)
INGRES	A relational database management software.
IR	Interim Remediation
IRIS	Integrated Risk Information System. An Environmental Protection Agency (EPA) database containing verified reference doses (RfDs) and slope factors, and up-to-date health risk and EPA regulatory information for numerous chemicals. IRIS is EPA's preferred source for toxicity information for Superfund.
IS	Indicator score (EPA)
ISD	Interim status document
ISV	*In situ* vitrification
ISVRL	Interim soil vapor restoration level
K	Kelvin
K_d	Distribution coefficient. A measure of the retardation of a given substance as water containing it passes through a porous medium (the aquifer). The value of K_d is specific for each solute; the higher the K_d, the more likely the solute will be bound (at least temporarily) by sorption rather than remaining in water. Thus, its migration potential is retarded. The K_d for pure water is defined as 1.
kg	Kilogram
KGRA	Known geothermal resources area
Kgv	Cretaceous Great Valley sequence
K_{oc}	Organic carbon partition coefficient; soil organic carbon to water partition.
K_{ow}	Octanol-water partition coefficient
kV	Kilovolts
kW	Kilowatt
kWh	kilowatt hours
L	Liter(s)
lb	Pound
LBL	Lawrence Berkeley Laboratory
LD	Lethal dose
LD_{50}	Median lethal dose (EPA)
LDH	Lactic dehydrogenase
LDR	Land disposal restrictions
LDRD	Laboratory-directed research and development
LEL	Lower explosive limit (Safety)
LIA	Local implementing agency

LLL	Lawrence Livermore Laboratory, an earlier name for Lawrence Livermore National Laboratory (LLNL)
LLMW	Low-level mixed waste
LLNL	University of California Lawrence Livermore National Laboratory
LLRW	Low-level radioactive waste
LNAPL	Light nonaqueous-phase liquid (e.g., gasoline) with density less than water
LOAEL	Lowest observed adverse-effect level (toxicology)
LOD	Limit of detection
LOEL	Lowest observed effect level (toxicology)
LOQ	Limit of quantification (EPA); 10 times the standard deviation.
LRL	Lawrence Radiation Laboratory, an earlier name for Lawrence Livermore National Laboratory (LLNL) and Lawrence Berkeley Laboratory (LBL).
Ls	Landslide
LSA	Low specific activity
LSRSL	Livermore Site Restoration Section Leader
LTC	Long-term concentration (EPA)
LUFT	Leaking underground fuel tank
LUST	Leaking underground storage tank
LWRP	Livermore Water Reclamation Plant
µg/kg	Micrograms per kilogram
µg/L	Micrograms per liter
M	Designation for earthquake magnitude
m	Meter(s)
M&I	Materials and items
M&TE	Measuring and Test Equipment
M_L	Designates the local (less than 100 km) or Richter magnitude.
m.y.a.	Million years ago
MBAS	Methylene-blue active substances; anionic surfactants; detergents
MCL	Maximum Contaminant Level. A drinking-water standard.
MCLG	Maximum Contaminant Level Goal. A drinking-water standard.
MDL	Method detection limit; three times the standard deviation.
ME	Mechanical Engineering
MED	Minimum effective dose (EPA)
MEIC	Major equipment installed cost
MEK	Methyl ethyl ketone

meq/L	Milliequivalent per liter
mg/kg	Milligrams per kilogram. Equals parts per million precisely.
mg/L	Milligrams per liter
mi	Mile(s)
MIBK	Methyl isobutyl ketone
min	Minute(s)
MLS	Multi-layer sampler
mo	Month(s)
MONITOR	A computerized database to maintain the current LLNL Site 300 chemical analysis data.
MOU	Memorandum of Understanding (EPA)
MPC	Material procurement charge
MPN	Most probable number of fecal coliform bacteria in 100 ml of water (toxicology).
MRDLG	Maximum Residual Disinfectant Level and Goal (EPA)
mrem/h	Millirems per hour
MS	(1) Mass spectrometry; or (2) Matrix spike
M_S	Designates the surface-wave magnitude of an earthquake. Calculated based on recordings made at distances of 20–160 km from the earthquake epicenter, and, ideally, from long-period instrumentation.
mS/m	Milliseimens/meter
MSD	Matrix spike duplicate
MSDS	Material safety data sheet
MSL	Mean sea level
MTBE	Methyl tertiary butyl ether. A fuel additive.
mV	Millivolts
MW	Monitor well
n	Total porosity (soil)
NAA	Non-attainment area
NAAQS	National Ambient Air Quality Standards
NaCl	Sodium chloride
NAPL	Nonaqueous-phase liquid
NAWQC	National Ambient Water Quality Criteria (EPA)
NAZ	Non-attainment zone
nc	Non-cancer; in EPA PRGs.

NC	Noncarcinogen (EPA)
NCP	National Oil and Hazardous Substances Pollution Contingency Plan (EPA)
ND	Nondetectable. Laboratory analyses did not detect or report the chemical of interest at or above the detection limit.
NDERF	Nuclear Directed Energy Research Facility
n_e	Effective porosity (soil)
NEMA	National Electric Manufacturers Association
NEPA	National Environmental Policy Act. A Federal statute that imposed the first requirements on agencies to consider the environmental effects that may result from particular actions. One provision of NEPA requires the preparation of an Environmental Impact Statement (EIS) by Federal agencies when "major" actions are taken that could have a "significant" environmental effect.
NERI	Northeast Research Institute
NESHAP	National Emission Standards for Hazardous Air Pollutants. These standards are found in the Clean Air Act; they set limits for such pollutants as beryllium and radionuclides.
NF	Natural fracture
NFEC	Naval Facilities Engineering Command
NFPA	National Fire Protection Association
NGL	Natural gamma log. A type of geophysical borehole survey.
NGVD	National Geodetic Vertical Datum
NH_3	Ammonia
NH_4	Ammonium
NHPA	National Historic Preservation Act
NIH	National Institute of Health
NIOSH	National Institute for Occupational Safety and Health
NL	Neutron log
NO_2^-	Nitrite
NO_3^-	Nitrate
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No observed adverse-effect level (toxicology)
NOEC	No Observable Effects Concentration
NORS	National Organics Reconnaissance Survey
NPDES	National Pollutant Discharge Elimination System. This Federal regulation, under the Clean Water Act, requires permits for discharge into surface waterways. LLNL holds NPDES permits for cooling-water discharges and for ground water treatment-system effluent discharge.

NPDS	National Pollution Discharge Standards
NPDWR	National Primary Drinking Water Regulations (EPA)
NPL	National Priorities List. The EPA is list of the top-priority hazardous waste sites in the country that are subject to the Superfund program.
NQA	(1) Nuclear Quality Assurance; or (2) National Quality Assurance
NRC	Nuclear Regulatory Commission
NRTL	Nationally Recognized Testing Laboratory
NTP	National Toxicology Program
NUFT	Nonisothermal Unsaturated Flow and Transport
O&G	Oil and grease
O&M	Operation and Maintenance
o.d.	Outside diameter. A measure of pipe or well casing size.
$^{\circ}$C	Degrees Celsius
OC	Organic Carbon
Octol	Another term for trinitrotoluene (TNT)
OERR	Office of Emergency and Remedial Response (EPA)
OGWDW	Office of Ground Water and Drinking Water (EPA)
OGWP	Office of Ground Water Protection (EPA)
OH$^{\bullet}$	Hydroxyl radical
OHEA	Office of Health Effects Assessment (EPA)
ORD	Office of Research and Development (EPA)
OSHA	U.S. Occupational Safety and Health Administration
OSP	Operational safety plan
OSWER	Office of Solid Waste and Emergency Response (EPA)
OTD	Office of Technology Development. A DOE office.
OTL	Operations Team Leader
OU	Operable Unit
OVA	Organic vapor analyzer (soil vapor studies)
OVM	Organic vapor monitor (soil vapor studies)
P&ID	Piping and instrument diagram
PA/SI	Preliminary Assessment/Site Investigation
PAH	Polynuclear aromatic hydrocarbon (see PNA)
PAT	Purge and trap (GC Methodology)
PBB	Polybrominated biphenyl

PC	Potential carcinogen (EPA)
PCAH	Polycyclic aromatic hydrocarbon; also abbreviated PNA.
PCB	Polychlorinated biphenyl compound
PCE	Tetrachloroethylene. A volatile organic compound (VOC) commonly used as an industrial solvent. It is also known as perchloroethylene (hence the abbreviation PCE), or tetrachloroethene.
pCi	Picocuries
pCi/L	Picocuries per liter in aqueous solution
pCi/L_{sm}	Picocuries per liter of soil moisture
PDF	Pathway dose factor
PE	Plant Engineering
PEF	(1) Particle emission factor, in EPA PRG; or (2) Pathway exposure factor, in EPA PRG.
PEL	Permissible Exposure Limit
PEPE	Plant Engineering Project Engineer
PEPM	Plant Engineering Project Manager
pH	A measure of the acidity or alkalinity of an aqueous solution. pH is the negative logarithm of the hydrogen ion concentration in the solution.
PHE	Public Health Evaluation (EPA)
PHRED	Public Health Risk Evaluation Database (EPA)
PID	Photoionization detector
PLC	Programmable logic controller
PLUME	A computer code used to simulate transport of a solute in an aquifer. It simulates (1) longitudinal and lateral dispersion, (2) linear partitioning, and (3) first order decay (of solvents).
PNA	Polynuclear aromatic
PO	Purchase order
PO_4-P	Total phosphates
POM	Point-of-measurement. Datum typically located at the top of a well's protective cover for measuring ground water elevations.
POU	Point of use
PP	Proposed Plan
ppb	Parts per billion. Equals µg/kg, and, approximately, µg/L.
PPE	Personal Protection Equipment
ppm	Parts per million. Equals mg/kg, and, approximately, mg/L.
$ppm_{v/v}$	Parts per million on a volume-to-volume basis

ppt	Parts per trillion (or sometimes parts per thousand)
PQL	Practical Quantitation Limit (EPA); Roughly Equivalent to the LOQ.
PRAP	Proposed Remedial Action Plan. A preliminary version of a plan to clean up ground water and soil contamination at a site on the National Priorities List (NPL). This plan is submitted to public scrutiny during a public comment period, and the final version must be approved by the relevant agencies before it can be enacted.
PRG	Preliminary remediation goal (toxicology)
PRP	Potentially responsible party
psi	Pounds per square inch
psig	Pounds per square inch gauge
PSO	Protective service officer (LLNL)
PTU	Portable Treatment Unit
PVC	Polyvinyl chloride
QA	Quality assurance
QA/QC	Quality assurance/Quality control
QAC	QA/QC Coordinator
Qal	Quaternary alluvial deposits
QAM	Quality Assurance Manager
QAP	Quality Assurance Plan
QAPP	Quality Assurance Project Plan
QC	Quality control
QCCS	Quality control check standards
Qls	Quaternary landslide deposits
Qt	Quaternary terrace deposits
R	Retardation factor (ground water)
RAGS	Risk Assessment Guidance for Superfund, in ERA PRGs.
RAIP	Remedial Action Implementation Plan
RAMP	Remedial Action Master Plan
RAO	Remedial action objective
RAP	Remedial Action Plan (California DoHs)
RASA	Regional Aquifer-System Analysis (USGS)
RAT	Remedial Action Technology
RBCA	Risk Based Corrective Action (ASTM)

RCRA Resource Conservation and Recovery Act. The RCRA was approved in 1976 as an amendment to the first Federal solid waste legislation, the Solid Waste Disposal Act of 1965. In the RCRA, Congress established initial directives and guidelines for the EPA to regulate the management of hazardous wastes as they are produced.

RD Remedial design

RD1 Remedial Design Report No. 1

RD2 Remedial Design Report No. 2

RD3 Remedial Design Report No. 3

RD4 Remedial Design Report No. 4

RD5 Remedial Design Report No. 5

RD6 Remedial Design Report No. 6

RDOSL Remedial Design and Operations Section Leader

RDX A high explosive, known also as cyclonite or hexogen. Its chemical name is: cyclotrimethylenetrinitramine, or hexahydro-1,3,5-trinitro-1,3,5-triazine ($C_3H_6N_6O_6$). The common meaning for the acronym RDX is Research Department Explosive. It was first formulated by the United Kingdom during World War II.

RE Remediation Engineer

REL Reference exposure level

RES Residential exposure

RET Restricted entry time (at Site 300)

RF Radio frequency

RfD Reference dose. The EPA's preferred toxicity value for evaluating noncarcinogenic effects resulting from exposures at Superfund sites. When used without other modifiers, RfD either refers generically to all types of RfDs or specifically to chronic RfDs; it never refers specifically to subchronic or developmental RfDs (toxicology).

RH Relative humidity

RI Remedial investigation. An investigation conducted to assess fully the nature and extent of the release, or threat of release, of hazardous substances, pollutants, or contaminants. This investigation gathers the necessary data to support the corresponding feasibility study (FS).

RI/FS Remedial investigation/feasibility study

RL Remediation level

RMCL Recommended Maximum Contaminant Level (EPA; Health based)

RME Reasonable Maximum Exposure (EPA PRGs)

RMPP Risk Management Prevention Plan

RNA Remediation by natural attenuation

ROD	Record of Decision. A document outlining the steps followed to arrive at a final cleanup decision for a site on the National Priorities List (NPL). The ROD is based on information and technical analysis generated during the RI/FS and consideration of public comments and community concerns. All comments received during the public comment period, in writing or expressed orally at a public hearing, are responded to in a formal manner in a Responsiveness Summary of the ROD.
RP	Responsible party
RPM	Remedial Project Manager (EPA)
rpm	Revolutions per minute
RQD	Rock quality designation. The RQD is a measure of the continuity of the rock; measurements typically are made on drill cores. The RQD is a percent value based upon the number of core lengths that measure 4 in. (10 cm) or greater in a given core run. If the core is relatively unfractured, it has a high RQD; if the core has many fractures, the RQD is low.
RSD%	Percent relative standard deviation
RTD	Resistance temperature device
RWQCB	Regional Water Quality Control Board. A California state agency that exercises regulatory authority over water quality standards within its jurisdiction and enforces State water quality laws. Site 300 is under the jurisdiction of the Central Valley Region RWQCB, and the Livermore Site is under the jurisdiction of the San Francisco Bay Region RWQCB.
S	Storage coefficient
SAIC	Science Applications International Corporation
SAL	State action level. Recommended drinking water quality guidelines developed by the DHS to identify contaminant concentrations that pose potential health risks. If contamination is found in concentrations above the Action Level, measures must be taken to decrease the contaminant concentration (CCR Title 22+).
SAP	Scientific Advisory Panel
SARA	Superfund Amendments and Reauthorization Act of 1986. Modifications to CERCLA enacted on October 17, 1986. This act amended and reauthorized the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for 5 years, at a total funding of $8.5 billion. SARA also strengthens State involvement in the cleanup process, encourages the use of treatment technologies and permanent solutions, and subjects Federal facilities to the same requirements to which other responsible parties must adhere, once they are placed on the Superfund NPL.
SB	Soil-bentonite
SC	Sample coordinator
scfm	Standard cubic feet per minute
SCNTCT	Scintillation count(s)
SCVWB	Santa Clara Valley Water District (in California)

SDA	Specific discharge approximation
SDI	Subchronic Daily Intake (EPA)
SDWA	Safe Drinking Water Act
SEAM	Superfund Exposure Assessment Manual (EPA)
SF	Slope Factor; related to carcinogenic values; EPA PRGs.
SFMP	Surplus Facilities Management Program (DOD)
SFTF	Small firearms training facility located in Site 300's Pit 6 Study Area.
SGOT	Serum glutamic oxaloacetic transaminase
SI	Site investigation
SITE	Superfund innovative technology evaluation
SJCPHS	San Joaquin County Public Health Service
SJUAPCD	San Joaquin Unified Air Pollution Control District
SMACCNA	Sheet Metal and Air Contitioning Contractors National Association, Inc.
SMR	Standard mortality ratio (toxicology)
SNARL	Suggested no adverse response level
SNL	Sandia National Laboratories, located in Livermore, California, and Albuquerque, New Mexico.
SNR	Signal-to-noise ratio. Measure of electrical or acoustical signal strength to ambient and source-generated noise strength.
SOC	Soluble organic carbon (waste-water studies)
SOLUTE	A simplified one-dimensional numerical model used to analyze solute flow.
SOLVEQ	SOLVEQ is a FORTRAN code used to compute multicomponent homogeneous chemical equilibria in aqueous systems.
SOP	Standard operating procedure
SP	The self-potential of the interface of a two dissimilar formations, e.g., sandstone and mudstone. A small electrical potential forms across the interface of such media, related to the different resistivity of formation fluids. SP instruments are standard well logging tools.
SPACT	Sampling plan and chain-of-custody tracking database
SpC	Specific conductance
SPCC	(1) Spill prevention containment and control; or (2) System performance check compounds
SPDES	Surface Water Pollution Discharge Elimination System
SPE	Solid-phase extraction
SPHEM	Superfund Public Health Evaluation Manual (EPA)
SPR	Single-point resistance

SRS	Savannah River Site (DOE)
SS	Suspended solids (waste-water term; in mg/L)
SSF	Surface soil flux
SSO	Site Safety Officer
SSWMB	State Solid Waste Management Board for California landfills
STC	Short-term concentration (EPA)
STLC	Soluble threshold limit concentration. A State method and value that can be used to determine if a waste is hazardous. Specifically, STLC means the concentration of a solubilized and extractable bioaccumulative or persistent toxic substance which, if equaled or exceeded in a waste or waste extract, renders the waste hazardous (California Code of Regulations Title 22, section 66260.10, p. 645).
STP	Standard temperature and pressure
SVE	Soil vapor extraction
SVOA	Semivolatile organic analysis
SVOC	Semivolatile organic compounds
SVRA	State Vehicular Recreation Area. Operated by the State of California. The Carnegie SVRA is located immediately south of Site 300.
SVS	Soil vapor survey. An SVS provides volatile organic compound (VOC) and semivolatile organic compound (SVOC) chemical data on sources and extent of contaminants within underlying soil and ground water. Active vacuum induced (AVI) soil vapor samples are collected by driving a hollow probe into the ground and evacuating a small amount of vapor. The samples are then analyzed either offsite or onsite for VOCs. Passive SVSs use vapor collectors that are buried for several days and are subsequently analyzed offsite.
SWAT	Solid-waste assessment test; mandated by California Calderon Bill.
SWMU	Solid Waste Management Unit
SWRCB	State Water Resources Control Board (California)
SWRI	Site-Wide Remedial Investigation report for LLNL Site 300
SY	Specific yield
SYSTAT	A computer code used in data entry and management.
T	Transmissivity
T&O	Taste & Odor (EPA)
T-BOS	Tetra 2-ethylbutylorthosilicate
$t_{1/2}$	Symbol for half-life

TAG Technical assistance grant. A grant offered by the Environmental Protection Agency (EPA) to the community in the neighborhood of a cleanup site. The community may receive this grant to pay for an independent expert on cleanup issues to assist them in making informed comments during the public involvement process.

T_b Boiling point temperature

TBC To be considered

TBD To be determined

TBI To be installed

TCA Trichloroethane. A volatile organic compound (VOC) widely used as a solvent.

TCAc Trichloroacetic acid

TCDD Tetrachlorodibenzodioxin

TCE Trichloroethylene. A volatile organic compound (VOC) widely used as an industrial degreaser; as a solvent for oils, paints, and varnishes; and as a dry cleaning agent. Sometimes called trichloroethene.

TCL Target compound list

TD Total depth (well drilling)

td Temperature dependent (value; EPA)

TDS Total dissolved solids (chemical analysis of natural water). The total chemical substances dissolved in an aqueous solution. TDS is measured by obtaining the weight of the residue on evaporation of a volumetrically measured sample of the water.

TEL Tetraethyl-lead; “organic lead” (RWQCB).

TEPH Total extractable petroleum hydrocarbons

TFA Treatment Facility A

TFB Treatment Facility B

TFC Treatment Facility C

TFD Treatment Facility D

TFE Treatment Facility E

TFF Treatment Facility F

TFG Treatment Facility G

TFG-1 Treatment Facility G-1

TFG-2 Treatment Facility G-2

TFIR Air quality monitoring station located in the city of Tracy.

THM Trihalomethane

THQ Target hazard quotient; EPA PRGs.

TI	Technical impracticability
TICs	Tentatively identified compounds
tics	Total ion counts. A measurement of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) in passive soil vapor surveys (SVSs).
TIE	Technical Information Exchange (DOE)
TKN	Total Kjeldahl nitrogen; A generic test for organic nitrogen compounds.
TL	Temperature log
TLD	Thermolinescent Dosimeter
TLV	Threshold limit value (toxicology)
T_m	Melting point temperature
TMA	Thermo Analytical, Inc. Also known as TMA/Norcal.
Tmss	Miocene Cierbo Formation
Tn	Miocene Neroly Formation
$Tnbs_1$	Miocene Neroly Formation Lower Blue Sandstone
$Tnbs_2$	Miocene Neroly Formation Upper Blue Sandstone
TNT	Trinitrotoluene, a well-known high-explosive compound.
TOC	(1) Top of Casing (Elevation); or (2) Total organic carbon
TOH	Total organic halogens; see also TOX.
TSCA	Toxic Substances Control Act
TOX	Total organic halogens
TPA	Tracy planning area
TPH	Total petroleum (fuel) hydrocarbons
TPH-D	Total petroleum (fuel) hydrocarbons as diesel
Tps	Pliocene nonmarine unit
Tpsg	Pliocene nonmarine unit (gravel facies)
TQs	Toxicity Quotients
TREAT	Technical remediation evaluation and assessment team
TRPH	Total recoverable petroleum (fuel) hydrocarbons
TS	Total solids (waste water)
TSCA	Toxic Substances Control Act
TSDF	Treatment, storage, or disposal facility
TSS	Total suspended solids (waste water)
TTHM	Total trihalomethanes

TTLC	Total threshold limit concentration. A State method and value for determining if a waste is hazardous. Specifically, TTLC means the concentration of a solubilized, extractable, and nonextractable bioaccumulative or persistent toxic substance which, if equaled or exceeded in a waste, renders the waste hazardous (CCR Title 22, section 66260.10, p. 645).
TTO	Total toxic organics (waste water)
Tts	Eocene Tesla Formation
TUc	100% no observable effects concentration (NOEC)
TVC	Tri-Valley CAREs
TWA	Time-weighted average (toxicology)
TWINSPAN	Two-way indicator species analysis. The TWINSPAN algorithm produces an ordered, two-way classification of species and samples.
UBC	Uniform Building Code
UCL	Upper confidence limit
UCRL	University of California Radiation Laboratory, Livermore. Former name of Lawrence Livermore National Laboratory (LLNL).
UEL	Upper explosive limit (safety)
UF	Uncertainty factor
UL	Underwriter's Laboratory
URL	Uniform resource locator
USCOE	U.S. Corps of Engineers
USCS	Unified Soil Classification System
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground storage tank
UV	Ultraviolet
UV/ H_2O_2	Ultraviolet/hydrogen peroxide
V	Volts
v/v	Volume per volume basis
VC	Vinyl chloride
VDL	Variable density log. A display of the amplitude and frequency of an acoustic waveform.
VES	Vapor extraction system
VF	Volatilization factor; EPA PRGs.

VLEACH	A one-dimensional numerical model to simulate downward migration of VOCs from potential release sites. The code simulates the transport of volatile, sorbed contaminants through unsaturated soil of constant moisture content.
VOA	Volatile organic analysis
VOCs	Volatile Organic Compound(s). A group of organic compounds characterized by their tendency to evaporate easily at room temperature. Some familiar substances containing VOCs are solvents, gasoline, paint thinners, and nail polish remover. TCE, DCE, PCE, and TCA are all VOCs.
vs	Versus
VSS	Volatile suspended solids (waste water studies)
w	Weight of measure
W(u)	Symbol for well function (hydrology)
WA	Weiss Associates
WAA	Waste accumulation area. Temporary waste storage area at LLNL.
WDR	Waste discharge requirement
WFA	West Firing Area
WQC	Water Quality Criteria (EPA)
WTA	Weapons Test Area
XRD	X-ray diffraction
y	Year(s)
yr	Year(s)

Notes: EPA refers to the U.S. EPA unless otherwise noted.